

REMARKS

Claims 25-27 have been canceled. Claims 1-24 and 28-31 are still pending in the application.

In the office action mailed on January 10, 2005, the examiner rejected claims 1-4, 15-18, 20, 21, 24, and 28 under 35 U.S.C. § 102(b) as being anticipated by Shinagawa (U.S. Patent No. 6,363,368).

The following quotation states the standard the examiner must meet to establish an anticipation rejection: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP § 2131.

Shinagawa does not teach an important limitation recited in claims 1, 9, 15, 20, and 28. Claim 24 has been currently amended to include this same limitation, which is that a "biased random value" is used to select a particular mating combination between generations. Using a "biased random value" to select a particular mating combination does not mean simply choosing the mating combination with the highest composite score (a deterministic approach). Rather, it means using a *random value* that is *not uniformly distributed* (i.e., biased or skewed) to select a particular mating combination.

The example given in the specification is as follows: The set of mating combinations 300 may be sorted in order from best composite score to worst (Specification, p. 6, lines 8-11 and Fig. 3). For example, the mating combination having the best composite score may have an index of "1"; the mating combination having the second best composite score may have an index of "2"; and so forth (*Id.*). A random number R that is uniformly distributed on the open interval (0,1) is generated, that random number is raised to a real-number power E greater than unity, the result is multiplied by the number of mating combinations M, and "1" is added to generate an index K on [1,M] that is biased (skewed) toward the low end of its range (i.e., toward smaller values) (Specification, p. 6, lines 14-25 and Fig. 4). Because K is biased toward smaller values, it favors the sorted mating combinations 305 that have a lower index

and, hence, a better composite score. Claims 9 and 15 expressly claim the foregoing technique.

The key point here is that *randomness* is involved in selecting the particular mating combination between generations, not a deterministic preference for mating combinations having favorable composite scores. Shinagawa does teach favoring the chromosomes that have better fitness values *in general*, but that is a necessary condition for any genetic optimization algorithm to converge. Shinagawa does not teach the above-described method for favoring mating combinations with better composite scores using a “biased random value.” Moreover, Shinagawa does not discuss using a random variable at all, whether uniform or biased, to select specific pairs of chromosomes (mating combinations) that are to undergo a crossover operation. Therefore, since Shinagawa does not teach all the limitations of claims 1, 9, 15, 20, 24 (as currently amended), and 28, it does not anticipate these claims, and they are believed to be allowable.

The foregoing arguments apply equally to the examiner’s rejection of claims 5, 6, 8-12, 14, 22, 25, 26, 29 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Shinagawa, as applied to the other claims rejected under 35 U.S.C. § 102(b). (Note that claims 25 and 26 have been canceled.) As discussed above, Shinagawa does not teach the limitation of using a “biased random value” to select a particular mating combination, and independent claim 9 (as well as the other independent claims, including amended claim 24) is allowable on that basis. Therefore, claims 5, 6, 8, 10, 11, 12, 14, 22, 29, and 30—all of which depend from allowable independent claims—are also allowable. The examiner has already indicated the allowability of remaining claims 7, 13, 19, 23, and 31 (claim 27 has been canceled).

Note also that claim 6 has been amended to correct a typographical error (a missing period at the end of the claim).

This application is considered to be in condition for allowance, and reconsideration of the application is requested.

Respectfully submitted,

By Thomas M. Croft

Thomas M. Croft

Reg. Number 44,051

April 7, 2005  
Fort Collins, CO 80528  
(970) 898-4218